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Statement of

The Honorable Elmer B. Staats
Comptroller General of the United States

before the

Joint Committee on Atomic Energy

on

The Possible Transfer of the Atomic Energy Commission's
Gaseous Diffusion Plants to Private Ownership

We are pleased to appear before your Committee to discuss the results of our review of the possible transfer of the Atomic Energy Commission's gaseous diffusion plants to private ownership. Our review was conducted in accordance with the October 24, 1968, request of Senator Pastore, then chairman of the Committee. Our report on this review was submitted to your Committee on May 20, 1969.

The three diffusion plants are located at Oak Ridge, Tennessee; near Paducah, Kentucky; and near Portsmouth, Ohio. The plants initially were constructed and operated for defense purposes; however, their future use will be primarily to provide enriched uranium for fuel in nuclear reactors of utilities for generating electric power.

The three plants and associated facilities were constructed during the 1940's and 1950's at a cost of about \$2.4 billion. Depreciation recorded on AEC's books, as of June 30, 1968, totaled about \$1.1 billion.

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We appreciate the complexity of the issues associated with the future disposition of AEC's diffusion plants, as well as the future of the entire uranium enrichment enterprise, including any new enrichment plants which might be built in the years to come. We hope that our report and the testimony presented by us today will assist in illuminating some of the issues involved.

Our review was directed primarily toward an evaluation of matters directly relating to the question of the possible transfer of the diffusion plants to private ownership with special emphasis on the methods for determining the value of the plants to the Government and to private industry. Our review did not include an estimate or appraisal of the value of the plants.

For the most part, we examined into the specific areas mentioned in the Committee's request. Our review included consideration of:

- the Government's obligations and responsibilities,
- the future demand for enrichment services,
- the installation of improvements to the existing plants,
- the increase in enrichment capacity by additions to existing plants and by construction of new plants, and
- the electric power costs for operating the existing plants.

We made no specific recommendations in our report concerning the future disposition of the plants. However, in some cases, we set forth what we believe may be the results of specific courses of action. Our comments on the areas examined into included discussions of various issues which the Committee may wish to consider in its evaluation of proposals for future ownership of the plants.

According to AEC, the demand for enrichment services--primarily for commercial use--will require enrichment plant capacity substantially in excess of the current gaseous diffusion plant capacity prior to 1980. Continued increases in demand for enrichment services are forecast into the 1980's which will require further expansions of U. S. enrichment capacity--if such capacity is to be responsive to the projected increased requirements for civilian nuclear power. During our study, however, we learned that the planning to meet the projected increasing demand will be somewhat dependent upon:

- the introduction of advanced converter and breeder reactors,
- the development of foreign enrichment capability,
- the extent to which the Government's highly enriched uranium becomes available for use in civilian power reactors,
- the extent to which plutonium is recycled for use as fuel in nuclear power reactors requiring enriched uranium, and
- possible changes in the diffusion plants' tails assays.

AEC's plans to increase the capacity of the existing plants through implementation of a cascade improvement program (CIP) and a cascade power uprating program (CUP) are estimated to cost \$600 to \$800 million, depending on the scope of the power uprating program. AEC's projections for these improvements indicate that they would be beneficial in substantially increasing the efficiency and capacity of the existing plants and could delay the need for a new plant for up to 2 years. Because of these benefits and their low estimated cost relative to the cost of equivalent new plant capacity, we believe these improvement programs would be attractive investments.

AEC projections show that commitments to build one or more new plants will be required during the 1970's. AEC estimates indicate that the cost of a new gaseous diffusion plant having a capacity of 8,750,000 separative work units would be about \$780 million, not including the commitment associated with contracting for the electric power required for its operation.

According to AEC, there are only two isotope separation processes--gaseous diffusion and gas centrifuge--which have or may have industrial potential in the United States. AEC has stated that the gas centrifuge process is currently not economically competitive with the gaseous diffusion process in this country and that whether or not the centrifuge process will become economically competitive is dependent on the outcome of further development effort on each process.

We reviewed AEC's development programs and, as a result, believe that AEC's statements present a fair assessment of the status of the two processes.

For purposes of analysis and in an effort to study methods that could be used in setting the value of the existing plants for use in considering the possible transfer to private ownership, we prepared estimates of the future earning power of these plants at hypothetical transfer dates. The estimated earning power of the diffusion plants is arrived at by determining the net cash flow which would result from operation of the three plants for each year of a given study period--say 1972 to 1990. The net cash flow is the difference between the cash revenues and the cash expenditures for each year of plant operations which falls within the study period. The revenues consist of proceeds from the sale of separative work. The expenditures consist primarily of payments for electric power,

operation and maintenance, principal and interest on debt, plant improvements, local taxes and insurance, and Federal corporate income tax. We chose to use the earning power method in our plant valuation studies because, in our opinion, it furnishes the best measure of the economic value of the gaseous diffusion plants to the Government or private industry and, depending upon the competitive forces at the time of sale, may have a closer relationship to the fair value of the plants than other methods of valuation.

The cash flows determined for each year of the study period were discounted at appropriate rates to arrive at "present values" at the beginning of the study period. This method takes into account the time value of money, which, in turn, is based on the concept that a dollar in hand is worth more than a dollar due a year in the future, and that a dollar due a year in the future is worth more than a dollar due two years in the future, and so on. The degree of difference between the value of the dollar in hand and the dollar due in the future is the expected rate which could be earned by investing the dollar in hand--say in a gaseous diffusion plant.

Using data on diffusion plant revenues and expenditures furnished us by AEC and certain basic assumptions--some fixed and some variable--relating to projected future operations and improvements, we computed a number of possible values for the three plants. Each of the values arrived at was dependent upon the specific assumptions used in preparing the estimate. A list of the assumptions we used in computing the plant

values is included in appendix II of our report, and the values arrived at are set forth in appendix III of our report.

Our analysis indicated that the economic value of the diffusion plants to private industry would be the lowest in 1972--the earliest transfer date we considered--and the highest in 1980--the latest transfer date we considered. This pattern is evidenced in all of the computed plant values and results from assumptions that the three plants will be operated at less than full capacity until about 1980 and full capacity thereafter and large capital expenditures will be required for the cascade improvement and power uprating programs.

We also computed the present values of the projected cash flows to the Treasury for (1) continued Government operation and (2) Government operation until assumed transfer dates of 1972, 1976, and 1980 and private operation thereafter through fiscal year 1990.

The cash flows to the Treasury from continued Government operation were based on plant operations from July 1, 1972, to June 30, 1990. The cash flows to the Treasury for Government operation until the assumed transfer dates and private operation thereafter included:

- cash flows from Government operation, if any, until the transfer date,
- the assumed sale price paid by the private owners,
- cash inflows for Federal corporate income tax that would be paid by the private owners, and
- cash outflows for projected Government separative work requirements purchased from the private owners.

We estimated that the present value of the net cash flow to the Treasury, using a discount rate of 7-1/2 percent, would be about \$1.85 billion from continued Government operation of the three existing diffusion plants and about \$1.15 billion, \$1.24 billion, or \$1.60 billion if the plants were transferred to private ownership in 1972, 1976, or 1980, respectively. In all cases studied the discounted net cash flow to the Treasury would be the highest under continued Government ownership. Transfer to private ownership in 1980 would result in the next largest cash flow to the Treasury.

The lower net cash flows to the Treasury that are projected in our studies under possible private ownership versus Government ownership result from several differences but, stated simply, the difference is essentially that even after considering an estimated sales price for the plants, cash flows to the Treasury from private owners would be limited to taxes on profits as compared with retaining the entire net income under Government ownership.

Considering the entire electric power fuel cycle economy, it may be unrealistic to assume that private owners would be willing to operate for the same net income that the Government would and hence retain the same prices for separative work. On the other hand, we thought it would be overly presumptuous to assume that a different pricing structure would be mandatory because of private ownership.

The lower net cash flows which the Treasury would receive if the plants were transferred to private ownership result from a number of factors, including:

--principal and interest payments by the private owners for funds borrowed to partially finance the plants and capital improvements,
--dividend payments and after tax profits to the private owners,
--slightly higher electric power costs to private owners,
--state and local taxes and insurance payable by the private owners,
and
--approximate 1 percent loss in separative work if the plants were operated independently under private ownership.

Different results could be obtained by using either different projections of revenues and expenditures from diffusion plant operations or different assumptions in preparing the estimates. We recognize that these factors are subject to change with the passage of time and that some of our assumptions could be legitimately debated by those having an interest in the future ownership of the enrichment enterprise. However, the data on plant revenues and expenditures furnished us by AEC appeared reasonable and the assumptions we chose represent, in our opinion, a range of reasonable alternatives for demonstrating the use of the earning power method in arriving at plant valuations and in comparing what the Government might receive if it either continued ownership of the diffusion plants or transferred them to private industry.

We also wish to advise the Committee that our studies of economic value pertained exclusively to the three existing diffusion plants. In considering the total effect on Government cash flows, we believe it is also appropriate to study the anticipated revenues and expenditures for the entire enrichment enterprise, including any new enrichment plants which might be

built in the future. However, it should be noted that such studies tend to be considerably more speculative in nature since they involve extrapolations of enrichment demand much further into the future than was the case with our studies.

At the conclusion of my statement, Mr. Chairman, members of my staff will present additional information on the results of our studies.

In order to meet the projected demand for enrichment services, large cash outlays will be needed for expansion of the uranium enrichment enterprise for fiscal years 1973-80. These outlays, which could amount to about \$2 billion, relate principally to the previously mentioned cascade improvement and power uprating programs and to the construction of additional enrichment plant capacity. In addition, a substantial investment amounting to about \$100 million would be required for preproduction of low-enriched uranium if the plants were transferred effective July 1, 1972. In our opinion, the need for these very large financial commitments would limit the number of potential investors in the enrichment enterprise.

In our report, we state that, from the standpoint of ensuring that additional enrichment capacity will be available when needed, early transfer of the three existing diffusion plants to private ownership would be a less favorable approach than continued Government ownership. We believe that many factors of uncertainty, which are discussed on pages 72 through 74 of our report, plus the very large monetary commitments associated with the construction of a new diffusion plant, could result in a situation where entry of the private investors required to provide sufficient additional enrichment capacity when needed could be difficult to achieve.

We also found, however, that under Government ownership, delays have already been encountered in implementing the cascade improvement program, in part because funds for the program must be obtained through the budgetary process. The advantages of Government retention of the diffusion plants from the standpoint of ensuring an adequate future supply of enrichment services would be diminished should further delays be encountered in funding needed plant improvements or in financing the required new enrichment plant capacity. Therefore, with respect to continued Government ownership, we believe that alternate methods of organization and funding which would ensure a timely means of independently financing the required additional enrichment capacity may be needed.

In connection with the question of possible private ownership, we believe that it will be necessary to consider whether appropriate arrangements could be made to provide reasonable compensation for the Government's considerable financial investment in the diffusion plants and to ensure that the legal and other obligations and responsibilities of AEC and the Government would be fulfilled satisfactorily. These obligations and responsibilities include:

- provision for making the maximum contribution to the common defense and security,
- promotion of the peaceful uses of atomic energy,
- the strengthening of free competition in private enterprise, and
- provision of continued assurance of the Government's ability to make available to other nations the benefits of the peaceful applications of atomic energy.

We believe that some arrangement would have to be made by the Government, in the event the three existing diffusion plants were transferred, to ensure that the private owners would meet the Government's commitments to supply enrichment services. The Government would also have to consider how to ensure that the additional demands of domestic and foreign customers would be met in the future.

We were not specifically requested to, nor did we examine into the national security aspects of a possible diffusion plant transfer. However, we, as outsiders coming in to review the question of transfer, were impressed by the importance of this issue. The AEC, in its March 1969 staff report, stated that a prime factor in considering the possible transfer of the plants to private ownership is that any such transfer shall not result in an undue increase in the risk of proliferation of nuclear weapons to other nations. We, of course, wholeheartedly agree. Accordingly, we believe the national security will be a prime factor during consideration of the future ownership of the uranium enrichment enterprise.

Our review also showed that disposition of three facilities, which are located at the diffusion plant sites but are not directly related to uranium enrichment for most commercial uses, would require special consideration. These are the Oak Ridge barrier plant and related facilities, the high-enriching segments of the Oak Ridge and Portsmouth plants, and the Paducah feed plant. In our opinion, the disposition of these facilities merit particular attention and should be considered independently in the event the diffusion plants are transferred to private ownership.

Mr. Chairman, in closing we wish to reiterate those matters discussed in the report which we believe your committee may wish to consider. These are:

- how the Government, in the absence of direct control of the enriching facilities, could ensure that an adequate supply of enriching services would continue to be provided at reasonable terms and prices to all qualified persons requiring such services;
- whether appropriate arrangements could be made to provide reasonable compensation for the Government's considerable financial investment and to ensure that the legal and other obligations and responsibilities of AEC and the Government would be fulfilled satisfactorily;
- what arrangements could be made to ensure that potential private owners would meet the Government's commitments to supply enrichment services and meet future demands of domestic and foreign customers on a nondiscriminatory basis and upon reasonable terms and conditions;
- the potential effect on the common defense and security of the possible transfer of the diffusion plants to private ownership;
- whether effective competition could be established both in the sale of the plants and the private operation of the plants;
- whether it would be desirable, in the event of transfer of the plants to private ownership, for the Government to establish regulations in regard to pricing schedules, type of service, and tails assays to ensure that these factors would be established so as to protect the interests of other segments of the fuel cycle economy and of the public; and

--possible methods of Government ownership as an alternative to either the existing arrangement or the transfer of the plants to private industry which would provide for (1) the timely installation of capital improvements to the existing plants financed as justified on the basis of minimizing the cost of enriched uranium and (2) the timely addition of new plant capacity.

Mr. Chairman, this concludes my prepared statement. We will be happy to answer any question you or members of your Committee may have either at this time or during the presentation of the results of our economic value studies, whichever you prefer. Thank you.